IN THE CLAIMS

Please amend the claims as follows:

Claims 1-25 (Canceled).

Claim 26 (Currently Amended): A method of detecting radiation comprising:

providing a layer of high purity single crystal CVD diamond having at least one of,

(i) in an off state, a resistivity R_I greater than 1×10^{12} Ω cm measured at an applied field of 50 V/μm and 300 K,

(ii) a $\mu\tau$ product greater than 1.5×10^{-6} cm^2/V, measured at an applied field of 10 V/μm and 300 K,

(iii) an electron mobility (μ_e) measured at 300 K greater than 2400 $cm^2V^{-1}s^{-1}$,

(iv) a hole mobility (μ_h) measured at 300 K greater than 2100 $cm^2V^{-1}s^{-1}$, and

(v) a high charge collection distance greater than 150 μm, measured at an applied field of 1 V/μm and 300 K;

applying an electric field of no greater than 0.5 V/μm to the layer;

exposing the layer to the radiation thereby generating a signal; and

detecting the signal.

Claim 27 (Previously Presented): A method according to claim 26 wherein the electric field applied to the diamond layer is less than 0.3 V/μm.

Claim 28 (Previously Presented): A method according to claim 26 wherein the electric field applied to the diamond layer is less than 0.2 V/μm.

Claim 29 (Previously Presented): A method according to claim 26 wherein the electric field applied to the diamond layer is less than 0.15 V/μm.

Claim 30 (Previously Presented): A method according to claim 26 wherein a thickness of the layer does not exceed 1 mm.

Claim 31 (Previously Presented): A method according to claim 26 wherein a thickness of the layer is less than 500 μm.

Claim 32 (Previously Presented): A method according to claim 26 wherein a thickness of the layer is less than 250 μm.

Claim 33 (Previously Presented): A method according to claim 26 wherein a bias voltage less than 300 V is applied to the layer.

Claim 34 (Previously Presented): A method according to claim 26 wherein a bias voltage less than 200 V is applied to the layer.

Claim 35 (Previously Presented): A method according to claim 26 wherein a bias voltage less than 100 V is applied to the layer.

Claim 36 (Previously Presented): A method according to claim 26 wherein a bias voltage less than 75 V is applied to the layer.

Claim 37 (Previously Presented): A method according to claim 26 wherein the CVD diamond layer reaches at least 80% of saturated charge collection efficiency at the applied electric field.

Claim 38 (Previously Presented): A method according to claim 26 wherein the CVD diamond layer reaches at least 90% of saturated charge collection efficiency at the applied electric field.

Claim 39 (Previously Presented): A method according to claim 26 wherein the CVD diamond layer reaches at least 95% of saturated charge collection efficiency at the applied electric field.

Claim 40 (Previously Presented): A method according to claim 26 wherein the CVD diamond layer is capable of generating at least 7000 electrons per detection event for minimum ionising particles when operated at the applied electric field.

Claim 41 (Previously Presented): A method according to claim 26 wherein the CVD diamond layer is capable of generating at least 9000 electrons per detection event for minimum ionising particles when operated at the applied electric field.

Claim 42 (Previously Presented): A method according to claim 26 wherein the CVD diamond layer is capable of generating at least 12000 electrons per detection event for minimum ionising particles when operated at the applied electric field.

Claim 43 (Previously Presented): A method according to claim 26 wherein the CVD diamond layer is capable of generating at least 15000 electrons per detection event for minimum ionising particles when operated at the applied electric field.

Claim 44 (Currently Amended): A method according to claim 26 wherein the radiation is alpha particles and the CVD diamond is such that it generates a peak width (FWHM) in energy, expressed as [[§E/E]] δE/E, less than 20%.

Claim 45 (Previously Presented): A method according to claim 26 wherein the radiation is selected from beta particles, alpha particles, protons, other high energy nuclear particles, and high energy electromagnetic radiation.

Claim 46 (Previously Presented): A method according to claim 26 wherein the radiation is neutrons.

Claim 47 (Currently Amended): A detector ~~for use in a method according to claim 26~~ including a stand-alone, remote or hand-held device comprising:

a layer of high purity single crystal CVD diamond configured to operate at a bias voltage of less than 100V and having one or more of,

(i) in an off state, a resistivity R_I greater than 1×10^{12} Ω cm measured at an applied field of 50 V/μm and 300 K,

(ii) a μτ product greater than 1.5×10^{-6} cm^2/V, measured at an applied field of 10 V/μm and 300 K,

(iii) an electron mobility (μ_e) measured at 300 K greater than 2400 $cm^2V^{-1}s^{-1}$,

(iv) a hole mobility (μ_h) measured at 300 K greater than 2100 $cm^2V^{-1}s^{-1}$, and

(v) a high charge collection distance greater than 150 μm, measured at an applied field of 1 V/μm and 300 K.

Claim 48 (Canceled).

Claim 49 (Previously Presented): A detector according to claim 47 wherein the layer of high purity single crystal CVD diamond has a thickness of less than 1 mm.

Claim 50 (Canceled).